IN THE CLAIMS:

Please AMEND claims 13-25, as shown below.

1-12 (Cancelled)

13. (Currently Amended) A computer-implemented method, the method comprising:

determining cluster centers in a first data structure, wherein the first data structure comprises a lattice structure of weight vectors that create an approximate representation of a plurality of input data points;

performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers;

performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure; and

determining, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points,

wherein the method is an unsupervised method that is configured to be suitable for an on-line system.

14. (Currently Amended) ~~A~~ The method according to claim 13, wherein each iteration in the first iterative process comprises

selecting a winner weight vector for each data point on the basis of the distance between the data point and the weight vectors, and

calculating a next value for each weight vector on the basis of the current value of the weight vector and a first ~~neighbourhood~~neighborhood function of the distance on the lattice structure between the weight vector and the winner weight vector, and

wherein the second data structure comprises a first coefficient for each of the weight vectors in the lattice structure and each iteration in the second iterative process comprises calculating a next value of each first coefficient based on:

the current value of the first coefficient, and

a combination of

a first coefficient of the winner weight vector,

a second neighborhood function of the distance on the lattice structure between the weight vector and the winner weight vector, and

an adjustment factor for adjusting convergence speed between iterations.

15. (Currently Amended) ~~A~~ The method according to claim 13, wherein the determining the weight vectors that correspond to cluster centers comprises selecting local maxima in the second data structure.

16. (Currently Amended) ~~A~~ The method according to claim 14, wherein the combination is or comprises multiplication.

17. (Currently Amended) ~~A~~ The method according claim 14, wherein the second ~~neighbourhood~~neighborhood function is not monotonous.

18. (Currently Amended) ~~A~~ The method according to claim 14, wherein the first coefficients are limited to a range [0,1] and the second ~~neighbourhood~~neighborhood function gives negative or positive values, respectively, for some distances.

19. (Currently Amended) ~~A~~ The method according to claim 14, wherein the second ~~neighbourhood~~neighborhood function depends on a number of prior iterations.

20. (Currently Amended) ~~A~~ The method according to claim 13, wherein the input data points represent real-world quantities.

21. (Currently Amended) ~~A~~ The method according to claim 14, wherein the first data structure is or comprises a self-organizing map.

22. (Currently Amended) ~~A~~ The method according to claim 21, further comprising:

estimating an upper limit K for a number of clusters in the self-organizing map;

defining a coefficient vector $\Theta i = (\theta_{i,1}, \theta_{i,2}, \ldots \theta_{i,K})$ for each weight vector i in the self-organizing map, the coefficient vector comprising K second coefficients $\theta_{i,l}$, each of which represents a weighting between the weight vector i and a label l; and

assigning cluster label l to weight vector i if:

$l = arg\ max\ \theta_{i,k}$.

$1 \leq k \leq K$

23. (Currently Amended) ~~A~~ The method according to claim 22, wherein each iteration in the second iterative process comprises calculating a next value of each second coefficient based on the current value of the second coefficient and a combination of

a coefficient of the winner weight vector,

a third ~~neighbourhood~~neighborhood function of distance, and

an adjustment factor for adjusting convergence speed between iterations.

24. (Currently Amended) A computer-readable program product comprising a computer program code embodied on a computer-readable medium, wherein executing the computer program code in a computer causes the computer to carry out a method, the method comprising:

determining cluster centers in a first data structure, wherein the first data structure comprises a lattice structure of weight vectors that create an approximate representation of a plurality of input data points;

performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers;

performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure; and

determining, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points,

wherein the executing the computer program is configured to carry out an unsupervised method that is configured to be suitable for an on-line system.

25. (Currently Amended) A computer system, comprising:

first determination means for determining cluster centers in a first data structure, wherein the first data structure comprises a lattice structure of weight vectors that create an approximate representation of a plurality of input data points;

first performance means for performing a first iterative process for iteratively updating the weight vectors such that the weight vectors move toward the cluster centers;

second performance means for performing a second iterative process for iteratively updating a second data structure utilizing results of the iterative updating of the first data structure; and

second determination means for determining, based on the second data structure, several sets of weight vectors in said lattice structure such that in each set, the weight vectors correspond to the same cluster centers of the input data points,

wherein the computer system is configured to operate using an unsupervised method that is configured to be suitable for an on-line system.